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## ABSTRACT

5 A compact rotary compressor unit within internal intercooling includes a rotary shaft (10) with at least one compressor wheel (14,16) mounted thereon for rotation therewith. The compressor wheel (14,16) has an inlet end (18) of relatively small diameter and a radial discharge end (20) of relatively large diameter. A nominally donut-shaped intercooling heat exchanger (42) is centered about the shaft (10) to receive compressed air from the compressor wheel and cool the same. Both the compressor wheel (14,16) and the heat exchanger (42) are confined in a housing (28).